

## ABSTRACT

Cylinders having Al as a major constituent are orderly arrayed in an (Si, Ge) matrix. In a nanostructure in the form of a mixture film having a plurality of cylinders having Al as a major constituent, and a matrix region surrounding the plurality of cylinders and having Si and/or Ge as a major constituent, the total amount of Si and Ge is in the range from 20 to 70 atomic % in the mixture film, the cylinders are orderly arrayed, the diameter of the cylinders is in the range from 1 to 30 nm, and the interval between the cylinders is 30 nm or less.